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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

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ART UNIT

PAPER NUMBER

2811

DATE MAILED:

04/24/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/073,494

Applicant(s)

PAN ET AL.

Examiner

HUNG VU

Art Unit

2811



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Feb 12, 2001
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 23-28 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☐ Notice of Reference Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 20) ☐ Other:

Art Unit: 2811

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 25, line 2-3, and claim 26, lines 1-2, "a dielectric layered silicon substrate" is unclear as to how a dielectric can be silicon since silicon is a semiconductor?

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 23-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Segawa et al.

(PN 5,428,244, of record).

Segawa et al. discloses a gate stack on a dielectric layer comprising,

Art Unit: 2811

a polysilicon layer (3) disposed over the dielectric layer;  
a none-crystalline metallic silicide film (4) disposed over the polysilicon layer;  
a dielectric cap (7) on the non-crystalline metallic silicide film. Note Figure 12 of Segawa et al..

The examiner interprets that the temperature required to anneal tungsten silicide to become crystalline is higher than 850°C. Since the metallic silicide film is formed at temperature between 500 to 600°C, the metallic tungsten silicide is not crystalline.

With regard to claims 24 and 28, as discussed above, because tungsten silicide is not crystalline, it is inherent that the metallic silicide does not contain silicon clusters.

With regard to claim 26, as discussed above, it is inherent the dielectric layer is substantially devoid of pitting.

### ***Response to Arguments***

3. Applicant's arguments filed 02/12/01 have been fully considered but they are not persuasive.

It is argued, at pages 4-5 of the Remarks, that Segawa et al. does not disclose a gate stack comprising a non-crystalline or amorphous metallic silicide film because a metallic silicide film described by Segawa et al. is only an intermediary metallic silicide film which is crystallized prior

Art Unit: 2811

to formation of the final product of the gate stack. This argument is not convincing for the following reasons: this invention does not describe the final gate stack or gate electrode, because the final gate stack or gate electrode also includes source/drain regions, LDD regions, interlevel dielectric, interconnection, etc.. In fact, this invention also describes about an intermediary metallic silicide, not a final gate stack. Note pages 8-9 of the Specification. As describe in col. 13., lines 65-68, Segawa et al. clearly discloses a formation of the gate stack or gate electrode. The examiner use an intermediary structure of Segawa et al. to reject the intermediary structure of the claimed invention. Therefore, Applicant's claims 23-25, and 27-28 does not distinguish over the Segawa et al. reference.

It is argued, at page 5 of the Remarks, that Segawa et al. does not disclose a gate stack substantially devoid of silicon clusters. This argument is not convincing because Segawa et al. clearly describe the formation of non-crystalline metallic silicide layer, therefore, it is inherent that the metallic silicide layer of Segawa et al. does not contain silicon clusters.

It is argued, at pages 5-6 of the Remarks, that Segawa et al. does not eliminate the formation of silicon clusters within the gate stack formation, it is inherent that pitting of the gate stack dielectric layer will occur. This argument is not convincing because Segawa et al. teaches the formation of non-crystalline metallic silicide. It is inherent that the metallic silicide layer of

Art Unit: 2811

Segawa et al. does not contain silicon clusters. Therefore, it is also inherent that the dielectric layer is substantially devoid of pitting.

### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Serial Number: 09/073,494

Page 6

Art Unit: 2811

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to ***Hung Vu*** whose telephone number is **(703) 308-4079**. The Examiner is in the Office generally between the hours of 7:00 AM to 5:30 PM (Eastern Standard Time) Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ***Tom Thomas***, can be reached on **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

Vu

April 19, 2001

Steven Loke  
Primary Examiner

